There were in addition two very interesting cases of old, more or less walled-off fat necrosis. In one of these the cicatricial contraction around a large fat necrosis in the retroperitoneal tissue had led to the obstruction of the superior mesenteric vein with hemorrhagic infiltration and necrosis of a large piece of the small bowel.

In conclusion I may state that entrance of bile in cholelithiasis into the pancreatic duct is not the only cause for such lesions in the pancreas. According to the suggestion of Eppinger [11] and of Polya [12] serious pathological conditions arise in the pancreas whenever there is forced into the pancreatic duct any fluid capable of activating the pancreatic ferments which normally are present in the gland in an inactive state as proferments. The enterokinase of the duodenum would naturally be assumed to play an important role in this direction when its regurgitation into the pancreatic duct which is ordinarily impossible is facilitated by pathological conditions. Opie [13] has made the ingenious suggestion that such may be the case more easily when the pancreatic duct does not open through the duct of Wirsung at the papilla as ordinarily but through the usually atrophic *ductus Santorini* separately from the bile duct with less perfect protection from regurgitation of intestinal contents into it.

[13] Opie. Disease of the pancreas. 2d edition, 1910.

SYMPOSIUM ON GALL-BLADDER.

Discussion.

Dr. Emmet Rixford, San Francisco: There are two or three little points I noted in passing which perhaps might be mentioned. Dr. Moffitt stated that the pain in cholecystitis is due to distension of the gall-bladder; this may be true, but it does not necessarily mean that the gall-bladder under such circumstances is distended, i. e., the gall-bladder may not yield to the distending forces, for it is a common observation of surgeons that the pain is perhaps even greater in those cases of markedly contracted gall-bladder, in which the gall-bladder is little more than a cicatricial sac squeezing down upon the mass of gall-stones.

Dr. Eloesser remarked that the duct of Santorini drained certain portions of the pancreas into the pancreatic duct and that as a safety valve, or means of conducting the pancreatic secretion into the bowel in event of stoppage of the duct of Wirsung, was of little value. However, there is no doubt that it may act as such a safety valve, as shown by the case of a young woman of thirty with carcinoma of the biliary papilla, completely obstructing the ducts (at least it was evident that it produced complete obstruction of the common duct). We removed the carcinoma (November, 1899), implanted the choledochus into the duodenum and ligated the pancreatic duct. The duct of Santorini was exposed in the operation and was preserved. The patient lived for two years without symptoms or evidence of pancreatic indigestion. There were no fatty stools.

Concerning the danger of ascending infection following cholecystenterostomy, I would say that this patient returned one year after the operation with recurrence and in deep jaundice which was relieved by cholecystenterostomy. The operation was done with the Murphy button and no trouble of ascending infection followed, nor did the opening close. In another case of carcinoma of the choledochus in which we performed cholecystenterostomy also with a Murphy button, there was no evidence of ascending infection through many months of observation. We know that the opening did not close by the non-recurrence of the jaundice and by the fact that the Murphy button remained in situ (one objection to the Murphy button).

Dr. Terry spoke of the use of a bolster behind the lumbar region as assisting in exposing the ducts. It does another thing, it makes more tense the anterior abdominal wall. If one flexes the pelvis, doubling the patient up, he will find he can get an excellent exposure and with less difficulty in holding the intestines back and with consequently less trauma.

I am particularly interested in this symposium on gall-stone disease because I think it marks a little change in the Society's attitude toward the subject from that exhibited at Riverside in 1905. At that meeting I read a paper entitled "Early Operation in Gall-stone Disease," and reported 15 cases in my own practice in which there was a history of symptoms which might have been interpreted as indicating the presence of gall-stones. Nearly all these cases had sooner or later serious complications which interfered enormously with attack by operation and which in certain cases made operation futile, e. g., one such patient being opposed to operation had received medical treatment in San Francisco and was finally sent to Carlsbad. The cholecystitis was improved and after a while the patient returned home. On his arrival he had another attack and immediately packed his duds and went again to Carlsbad, with similar improvement. Possibly, had that man spent the remainder of his days in Carlsbad he would have been comfortable for a considerable length of time, but he returned home and shortly thereafter suddenly developed peritonitis. We opened the abdomen and found fat necrosis of the omentum, mesentery and retroperitoneal tissues generally. The digestion by the pancreatic ferments had destroyed the tissues about the mesenteric vein and cicatricial contraction had all but closed the vein. Thrombosis occurred and the man died of necrosis of the entire small intestine and ascending colon.

There were several other cases of chronic pancreatitis with fat necrosis, several of carcinoma in which it is pretty generally agreed that gall-stones are of etiological significance, two cases of perforation of the gall-bladder, several in which adhesions made operation hazardous, one or two cases of phlegmon of the gall-bladder.

I may say that I am very glad to have heard Dr. Terry's paper because I agree with everything he says. His comparison of the attitude of medical men towards early removal of the appendix is precisely the statement I made at Riverside in 1905, and which was earlier made by the late Dr. Richardson of Boston. My paper called forth the remark from a medical gentleman in discussion that 75 per cent. or so of people with gall-stones carry them with little or no discomfort and from a surgeon that "the only reason or justification he could see for advocating early operation in gall-stone disease was the hunger of the surgeon." I am glad to see that the Society is taking a different view of the matter at this time.

I do not, however, wish to put myself on record as advocating indiscriminate operation whenever gall-stones are known or are suspected to be present, and I of course acknowledge the value of medical measures in relieving the symptoms in gall-stone troubles. My position I think was clearly stated in the paper referred to and I have seen no occasion since to modify the opinions there expressed unless to strengthen them, viz., that gall-stones which have caused symptoms warranting the diagnosis to be removed surgically unless there is some complication making operation more

[11] Eppinger. Zur Pathogenese der Pankreasfettnekrose. Zeitschr. f. Exp. Path. & Ther., 1905, II, 216.

[12] Polya. Zur Pathogenese der akuten Pankreasblutung und Pankreasnekrose. Berl. Klin. Woch., 1906, XLIII, 1562.

hazardous than repeated attacks of cholecystitis; that early operation is vastly less hazardous than late; that the gall-bladder should be palpated for stones as a routine procedure in the course of abdominal operations for other lesions excepting in septic cases and in the presence of too great shock, for the information thereby gained may be of inestimable value to the patient; that gall-stones thus found had best be removed if such removal does not unduly prolong the operation or materially increase its risks and one has the permission of the patient to perform such removal quite as is done in the case of the appendix.

Dr. W. F. Cheney, San Francisco: So much has already been said in the course of the day in regard to the various phases of this subject that about all one can do is to call attention to the particular points that have been raised. I think one of the most important lessons that have been set forth here to-day is the increased knowledge of the frequency of gall-bladder disease. The man who is interested particularly in digestive work and has cases coming to him because of gastric disturbance, is learning more and more to discover how often the real seat of disease is in the gall-bladder. As Mayo says in one of his articles, to treat the stomach in one of these cases of gall-bladder disease is "like pouring water on the fire alarm box to put out the fire." The large proportion of disturbances that we used to call gastric neuroses are due to diseases of the appendix or gall-bladder. Unfortunately there is no type of gastric disturbance that we can say always is due to gall-bladder disturbance. Sometimes there is hyperacidity and the case resembles ulcer; sometimes subacidity and it resembles cancer; sometimes atony and stasis from adhesions, resembling obstruction of the pylorus. In any of these cases treating the stomach does no good, and this lesson seems to me most important. One point that Dr. Moffitt has particularly dwelt upon is the importance of a careful history. When we sift down the objective evidence of gall-bladder disease by physical or laboratory examination, it is very small, and we must make our diagnosis largely upon the clinical history. If this has been carefully taken, it is usually quite definite before the end of the history is reached. Physical examination is so often unsatisfactory, and the findings on physical examination of the gall-bladder region as compared with the findings at operation are so disproportionate, that we have learned not to trust so much to the physical signs provided the history is definite.

In regard to treatment, it has seemed to me for some time past that if we could draw a line between cases of cholecystitis and gall-stones we would have the dividing line between cases suitable for medical treatment and for the surgeon. If we know that a patient has stones in the gall-bladder, that patient should have his gall-stones out as promptly as possible. On the other hand, if we can establish a diagnosis of chronic cholecystitis, we can aid by medical treatment. But so many times the history of recurrent cholecystitis resembles so closely that of stones in the gall-bladder that it is very difficult to make a diagnosis between the two. In any case where we are uncertain, it is reasonable to try medical treatment for a time and, if there is no improvement, then to send the case to a surgeon. As to the treatment, I have nothing to add to what Dr. Fulton has suggested. As he has said, an abundance of hot water should be taken, and I think sometimes we get better results by the addition of phosphate of soda or Carlsbad salts to the hot water, perhaps because patients will take it more readily if something is mixed with the hot water than if not. As Dr. Fulton has said, make the diet fit the gastric condition and give a number of small meals rather than a few large ones.

In reference to the benefit from operation—I am constantly referring my cases to surgeons, and yet from time to time it is my experience, and doubtless that of every one of you, that after operation the symptoms recur. I have seen gall-stones recur in patients several years after operation, and I have frequently seen patients just as uncomfortable after the operation as before it was done. Surgeons admit these facts, and I only mention them because I think in every case we should consider carefully all the facts before we make promises to our patients as to what they are to gain by surgical operation.

Dr. W. F. Strietmann, Oakland: Relative to the drinking of large quantities of water, as mentioned by Dr. Fulton, I would rather believe that it is not so much a question of water simply, but rather one of water plus salts, and it seems to me that herein lies the efficacy of the spring cures. Dr. Martin H. Fisher has shown the effect of various salts on the edematous tissues, and there is no question that the first change in the inflammatory process of the living membrane is an edema.

Water alone in such tissues may flush to a certain extent, but may even increase the edema, while salts make it possible to get into the cell directly and increase the interchange of water between the cell and the circulation. As to the salt, it is not so much a question of sodium phosphate or sodium sulphate, but a question of alkaline water with a sufficient admixture of various neutral salts. The analysis of various spring waters show them to be essentially alkaline waters and the other salts vary within wide limits.

The condition of the stomach has been touched upon in the discussion and the general statement made that we see cases now of anacidity, now hyperacidity and again subacidity. Personally, I do not believe that it is quite so much a matter of chance, but feel that there is a more orderly sequence. Hyperacidity is probably the first change and goes with the irritative stage or early congestion, and I would rather believe that anacidity is the state we find in the more chronic, long-drawn-out case.

Dr. T. W. Huntington, San Francisco: In the diagnosis of chronic conditions affecting either the gall-bladder, pylorus, or duodenum, where pain is more or less constantly a factor, there is one sign which seems to be of considerable import. I refer to thickening or hypertrophy of the belly of the right rectus muscle in its upper third.

In cases, above named, if the observer stands at the foot of the patient, with the abdomen fully exposed, an appreciable elevation can be easily made out over the described area. It is necessary that good light be thrown upon the surface under consideration.

The explanation, which certainly is a rational one as accounting for the muscular hypertrophy, is easily found in the coexistent muscular contractions, associated with underlying pain of a continuous character. The sign is one to be regarded as confirmatory, rather than diagnostic.

It is encouraging to find that medical opinion has radically changed in the past few years as regards early operative interference in gall-bladder diseases. Every surgeon who has had experience in gall-bladder work has found his greater difficulties and embarrassing complications in those cases which have been deferred, and brought to operation as a last resort. These cases, as Dr. Cheney has said, present, as a legacy of the original disease, persistent symptoms, such as pain, faulty digestion and general disability.

Dr. C. G. Levison, San Francisco: Concerning the anomalous phases of gall-bladder disease which Dr. Cooper has referred to, there are several points that I think of sufficient importance to mention.

In one condition that he spoke of he did not lay as much stress upon as I think should be done, and that is where a stone is present in the choledochus compressing the portal vein; I have seen

several of these cases where the conditions produced an ascites in which the fluid was bile stained; when this condition is present, it may be by mistake treated as cirrhosis of the liver.

Another point that Dr. Cooper did not mention is the presence of a gumma compressing the bile ducts. Only recently I saw a case in which the diagnosis had been made by the family physician, Dr. Eidenmuller, who diagnosed lues and gall-bladder disease. A gumma was found compressing the bile ducts; gall-stones were also found, but the syphilis was the cause of the icterus.

Another condition simulating gall-bladder disease may proceed from the appendix. Occasionally one may encounter an appendix associated with leukocytosis, as high as 90 per cent. polys being found; icterus may also be present. When the abdomen is opened the gall-bladder is found to be normal and the removal of the appendix does away with the icterus that may have been present for a long time.

Regarding the surgical aspect of gall-bladder disease, Dr. Terry stated that he employed gauzes moistened with alboline which prevents their being saturated with the escaping contents of the gall-bladder.

My practice is to use dry compresses made by covering sheet wadding with gauze; if this sort of a pad is used 2 or 3 will do more towards packing away the intestines than a greater number of pads will accomplish.

Concerning the character of the incision to be made, in my opinion there is only one kind of an incision to make and that is a big one, large enough to easily expose the pathological conditions.

The so-called Elliott position in which the pillow is placed under the back is often productive of subsequent backache, more particularly in elderly people, and should be avoided if possible.

There is only one point in connection with the treatment of pancreatic disease, and that is the surgical treatment, and the following case is worthy of mention:

A number of years ago I was in Boston at the time when Mikulicz visited the Massachusetts General Hospital, where a case had been operated by Dr. C. A. Porter, who discovered an acute pancreatitis when the abdomen was opened. The pancreas had the appearance of a sausage and there was a question in Dr. Porter's mind as to what should be done; he made an incision through the capsule which extended from the head to the tail of the pancreas; he then drained the wound. Mikulicz at the time thought that the prognosis was absolutely bad, but the patient eventually recovered.

The treatment of pancreatic disease has not developed particularly since that time so that it is well to bear in mind the manner in which this particular case was treated.

Dr. E. H. Schneider, Los Angeles: I wish to say a few words in regard to cicatricial stenosis occurring at the junction of the cystic and hepatic ducts following cholecystectomy for stone in this region. The jaundice which is due to citatricial stenosis occurs within a couple of weeks following operation. It comes on without any pain, progressively deepens, later is accompanied by edema and anasarca and practically always proves fatal within three years.

I have seen three such cases. Exploration in all three cases did not occur until nine months to one and one-half years after the jaundice had occurred. Operation showed the common duct to be not much more than a fibrous cord due to extension of the cicatrix and a non-use atrophy. I would therefore advise that a jaundice appearing without pain within a few weeks after a cholecystectomy should be reoperated early in order that this condition may be recognized and remedied before it is too late.

Dr. C. M. Cooper, San Francisco: I would only say that I think Dr. Levison should report those cases in which the gall-stone was present in the common bile duct and pressed upon the portal vein thus causing ascites. I have seen only one suspicious case myself and the literature contains but few references to such a condition.

Dr. W. I. Terry, San Francisco: In regard to Dr. Rixford's statement about the position, I should have spoken of the flexed position. Dr. Rixford has done a good deal in devising a table which makes access very easy in certain cases.

THE WORK OF THE PASTEUR DIVISION OF THE STATE HYGIENIC LABORATORY.*

By J. C. GEIGER, M. D., Chief Bacteriologist, Bureau of the Hygienic Laboratory of the California State Board of Health, Berkeley.

In an article written in 1910, Black and Powers [1] reported a small outbreak of rabies among dogs in Los Angeles in 1898. They also reported a fatal human case in Pasadena in 1899 and another outbreak of rabies among dogs in the Soldiers' Home near Los Angeles in 1906. In Stimson's report on Rabies,[2] published in 1910, California was declared to be one of the states that was free from the disease. In 1909 the present epidemic began to attract attention and two articles by Sawyer [3] [4] show the spread of the disease up to April 1, 1912. The spread of rabies has been continuous and rapid throughout the state. The toll of human deaths has been 18 and the loss of valuable live stock has been considerable. Organized efforts have been made to check its progress, but the lack of co-operation on the part of the county officials, and a bitter opposition from other sources, have greatly retarded the work so far. The presence of rabies in any given community will cause considerable excitement and the passage of numerous laws, which in time are forgotten. In presenting this paper, I am endeavoring to place before you reliable statistics of rabies as it now exists in California. These statistics are based on actual work done by this division of the State Hygienic Laboratory. It must not be forgotten that diagnostic and other work in rabies is also done by municipal and private laboratories. For instance, the laboratory of the San Francisco Board of Health has made 277 positive examinations from April 1, 1912, to April 1, 1913. Five of the animals affected were persons, 259 were dogs, 4 were cows, 2 were horses and 8 were cats.

RESULTS OF LABORATORY EXAMINATIONS.

Beginning April 1, 1912, and ending March 31, 1913, 322 examinations of the brains of animals for rabies have been made in this laboratory. Of these specimens, 7 were in such a state of decomposition as to make examination impossible. 36 brains gave negative results and 279 were found positive. 252 of the positive cases were diagnosed by the finding of Negri bodies, and the balance by inoculation into rabbits, guinea-pigs and a monkey. Of the animals affected, 4 were human, 6 were cows, 10 were cats, 2 were goats, 3 were

* Read before the Forty-Third Annual Meeting of the State Society, Oakland, April, 1913.